



distribution; in case of sensing to determine a value of said external physical parameter or chemical compound from, and in case of intensity modulation to use said value to control, the ratio between the amount of light entering the activable light guide device in the form of one or more guided modes and the amount of light leaving the activable light guide device at an exit side in the form of similar guided modes.

14. A method as claimed in claim 13, wherein said activable light guide device comprises a light guide channel including an inclusion layer and/or a light transmitting layer of an electro-optical material, wherein, in order to obtain light modulation, segments of one type are activated by means of an electrical potential difference between two electrodes patterned in an electrically conductive intermediate layer on either side of the light transmitting channel.

15. A method as claimed in claim 13, wherein use is made of an inclusion layer and/or a light transmitting layer comprising a thermo-optical material and wherein segments of one type are activated by means of an electrical current driven through an electrical conducting intermediate layer introducing a segment pattern corresponding with a predetermined pattern of segments activated by the external physical parameter or chemical compound.

16. A method as claimed in claim 13, wherein the integrated optical light guide device is provided with a channel type light guide and in that the activable element comprises two types of segments, the channel widths of the two segment types being adapted to each other to obtain a maximum guided mode transmission for a predetermined value of the physical parameter or chemical compound.

RECEIVED  
JAN -5 2001  
FBI 2500 MAIL ROOM

17. A method as claimed in claim 13, wherein the light guide device is constructed as a quasi-digital sensor showing a large number of segments in order to obtain a narrow transmission peak around a predetermined value of the physical parameter or chemical compound its specific value being a function of the actual value of said physical parameter or chemical compound.

18. A method as claimed in claim 17, wherein the activating chemical component to be determined is a relative humidity to be determined, to which end an activable layer comprises a material showing a humidity dependent refractive index.

19. A method as claimed in claim 13, wherein the material and/or the refractive index profiles of relevant types of segments are adapted to each other to enable wavelength sensitive measurements by measuring the light emitted from different locations of the light guide device enabling determination of a power spectrum of the transmitted light.

20. A method as claimed in claim 13, wherein said activable light guide device comprises two types of segments S1 and S2, wherein S1 is activated by a quantity A and S2 is activated by a quantity B different from A and wherein S1 and S2 are incorporated in a feedback circuit generating, based on a criterion of a constant transmission by the activable light guide device, the relative index profile of S2 is maintained at a value equal to that of the refractive index profile of S1 by applying a suitable value B, to correlate the quantity A with a set value of quantity B.

21. An integrated optical light guide device at an entrance side provided with a light source and at an exit side provided with a light detector and, along a direction of light propagation, provided with several types of segments, each type of segments showing a different refractive index profile, whereof the refractive index profile of one or more types of activable segments depends on the value of an external physical parameter or chemical compound, said several types of segments being organized to carry out a method as claimed in any one of the preceding claims.

22. An integrated optical light guide device as claimed in claim 21, wherein said activable light guide device comprises two types of segments and wherein formation of segments is realized by means of a local physical or chemical treatment of an inclusion layer comprising a material activable by said external physical parameter or chemical compound.

23. An integrated optical light guide device as claimed in claim 21, wherein the activable light guide device includes a segmented, strip-loaded type channel light guide, wherein both the channel formation and the formation of segments is realized by a local physical treatment of an originally uniformly applied homogeneously activable inclusion layer.

24. An integrated optical light guide device as claimed in claim 21, wherein an inclusion layer and/or a light transmitting layer comprise an electro-optical material, in which layer local segment forming activation is realized by means of an electrical potential difference to be applied between a first electrically conducting layer deposited on a first side of said electro-optical layer, and a second electrically conducting layer deposited on an opposite side of said